CLAIMS

What is claimed is:

1. A method of determining a transfer function used for emphasizing a portion of an electromagnetic signal prior to being processed in a processing system comprising the steps of:

determining a discrete transfer function for said processing system;

determining a target transfer function such that said target transfer function multiplied by the inverse of said discrete transfer function produces a discrete pre-emphasis transfer function; and

transforming any unstable poles and/or zeros in said pre-emphasis transfer function to stable poles and/or zeros.

2. The method of Claim 1, wherein said discrete transfer function is determined using one or more selected from the group consisting of an S-function, input and output signals, the inverse-invariant method, and the Steiglitz-McBride algorithm.

3. The method of Claim 1, wherein said transformation of said unstable poles and/or zeros is accomplished using an all pass filter.

4. The method of Claim 1, wherein said target transfer function is a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.

5. The method of Claim 1, wherein said processing system comprises one or more selected from the group consisting of phase modulation, wideband phase modulation, wideband fractional

sigma delta modulation, and wideband fractional sigma delta modulation for a code division multiple access signal.

6. A method for electromagnetic processing of an input wave, wherein an input signal containing a characteristic of said input wave is processed to produce a modified signal, said method comprising the steps of:

receiving said input signal containing said characteristic of said input wave;

transforming said input signal using a pre-emphasis transfer function based upon determining a discrete transfer function for said processing of said input signal, determining a target transfer function such that said target transfer function multiplied by the inverse of said discrete transfer function produces said pre-emphasis transfer function, and transforming any unstable poles and/or zeros in said pre-emphasis transfer function to stable poles and/or zeros;

processing said input signal to generate said modified signal; and

regulating said modified signal using a control signal containing another characteristic of said input wave to produce an output signal.

7. The method of Claim 6, wherein said discrete transfer function is determined using one or more selected from the group consisting of an S-function, input and output signals, the inverse-invariant method, and the Steiglitz-McBride algorithm.

8. The method of Claim 6, wherein said transformation of said unstable poles and/or zeros is accomplished using an all pass filter.

9. The method of Claim 6, wherein said target transfer function is a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.

10. The method of Claim 6, wherein said modified signal is a phase modulated signal and said processing involves one or more selected from the group consisting of phase modulation, wideband phase modulation, wideband fractional sigma delta modulation, and wideband fractional sigma delta modulation for a code division multiple access signal.

11. The method of Claim 6, wherein said characteristic used to regulate said modified signal is magnitude.

12. The method of Claim 6, wherein said step of regulating said modified signal is performed using a plurality of segments.

13. The method of Claim 12, wherein one or more of said segments is independently controlled as a power amplifier by a portion of said two or more signals that represent said input wave to contribute power to an output signal.

14. The method of Claim 13, further comprising the step of generating an output signal by combining power outputted from one or more of said segments.

15. The method of Claim 14, wherein said step of generating an output signal by combining power is accomplished using one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks.

16. The method of Claim 12, wherein one or more of said segments is independently controlled as a current source by a portion of said two or more signals that represent said input wave to contribute current to an output signal.

17. A method of determining a transfer function used for emphasizing a phase signal from an input wave prior to being modulated in a phase modulator, said method comprising the steps of:

determining a discrete transfer function for said phase modulator;

determining a target transfer function such that said target transfer function multiplied by the inverse of said discrete transfer function produces a discrete pre-emphasis transfer function; and

transforming any unstable poles and/or zeros in said pre-emphasis transfer function to stable poles and/or zeros.

18. The method of Claim 17, wherein said discrete transfer function is determined using one or more selected from the group consisting of an S-function, input and output signals, the inverse-invariant method, and the Steiglitz-McBride algorithm.

19. The method of Claim 17, wherein said transformation of said unstable poles and/or zeros is accomplished using an all pass filter.

20. The method of Claim 17, wherein said target transfer function is a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.

21. An apparatus for electromagnetic processing of an input wave, wherein an input signal containing a characteristic of said input wave is processed in a processing circuit to produce a modified signal, said apparatus comprising:

a filter for receiving said input signal containing said characteristic of said input wave; and transforming said input signal using a pre-emphasis transfer function based upon determining a discrete transfer function for said processing of said input signal, determining a target transfer function such that said target transfer function multiplied by the inverse of said discrete transfer function produces said pre-emphasis transfer function, and transforming any unstable poles and/or zeros in said pre-emphasis transfer function to stable poles and/or zeros;

a processing circuit for processing said input signal after said transformation in said filter to generate said modified signal; and

an output circuit for regulating said modified signal using a control signal containing another characteristic of said input wave to produce an output signal.

22. The apparatus of Claim 21, wherein said discrete transfer function is determined using one or more selected from the group consisting of an S-function, input and output signals, the inverse-invariant method, and the Steiglitz-McBride algorithm.

23. The apparatus of Claim 21, wherein said transformation of said unstable poles and/or zeros is accomplished using an all pass filter.

24. The apparatus of Claim 21, wherein said target transfer function is a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.

25. The apparatus of Claim 21, wherein said modified signal is a phase modulated signal and said processing circuit is one or more selected from the group consisting of a phase locked loop, a phase modulator, a wideband phase modulator, a wideband fractional sigma delta modulator, and a wideband fractional sigma delta modulator for a code division multiple access signal.

26. The apparatus of Claim 21, wherein said characteristic used to regulate said modified signal is magnitude.

27. The apparatus of Claim 6, wherein said output circuit is an amplifier comprising a plurality of segments.

28. The apparatus of Claim 27, wherein one or more of said segments is independently controlled as a power amplifier by a said control signal to contribute power to said output signal, wherein said output circuit further comprises further comprises a combining circuit for combining the output from each of said segments to said output, and wherein said combining circuit comprises one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks.

29. The apparatus of Claim 27, wherein one or more of said segments is independently controlled as a current source by a portion of said two or more signals that represent said input wave to contribute current to an output signal.

30. A signal transmitter comprising:

a baseband processor for receiving an input wave and generating a magnitude signal and a phase signal representing said input wave;

a phase modulator for phase modulating said phase signal, said phase modulator having a modulator transfer function associated therewith;

a filter for transforming said phase signal prior to being modulated in said phase modulator, said filter having a pre-emphasis transfer function based upon determining a discrete transfer function from said modulator transfer function, determining a target transfer function such that said target transfer function multiplied by the inverse of said discrete transfer function produces said pre-emphasis transfer function, and transforming any unstable poles and/or zeros in said pre-emphasis transfer function to stable poles and/or zeros; and

an amplifier comprising a plurality of segments for amplifying said phase modulated signal using said magnitude signal to generate an output signal for transmission.

31. The transmitter of Claim 30, wherein said discrete transfer function is determined using one or more selected from the group consisting of an S-function, input and output signals, the inverse-invariant method, and the Steiglitz-McBride algorithm.

32. The transmitter of Claim 30, wherein said transformation of said unstable poles and/or zeros is accomplished using an all pass filter.

33. The transmitter of Claim 30, wherein said target transfer function is a low pass FIR filter having a gain of about unity across substantially all of the frequency range of said FIR filter.

34. The transmitter of Claim 30, wherein said output circuit further comprises further comprises a combining circuit for combining the output from each of said segments to said output signal, comprising one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks.

35. The apparatus of Claim 30, wherein one or more of said segments is independently controlled as a current source by a portion of said two or more signals that represent said input wave to contribute current to an output signal.